

Appl. No. 10/734,194  
Reply to Office action of October 13, 2005  
Response dated January 12, 2006

### REMARKS

This paper is submitted in response to the Office Action dated October 13, 2005. Claims 1-9 are pending in the application. Claims 1-7 have been withdrawn from consideration. Claims 8 and 9 have been rejected and are have now been canceled. New Claims 10-12 have been added. Claim 10 includes the limitations of canceled claim 8 and withdrawn claims 6 and 4. Claim 11 includes the limitations of canceled claim 8 and withdrawn claims 6, 5 and 4. New claim 12 corresponds to canceled claim 9. No new matter has been added.

Claims 8 and 9 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious in view of EP 1 245 554 ("EP '554") or EP 1 245 555 ("EP '555"). As stated above claims 8 and 9 have been canceled and corresponding claims 10-12 have been added.

The Examiner states that the cited references do not disclose claimed formula (1'). However, the Examiner alleges that formula (1) disclosed in EP '554 and formula (2m) disclosed in EP '555 can be sulfonated to form the same or similar products. Therefore, the Examiner concludes that claimed formula (1') would be inherent in the cited references.

However, it is respectfully submitted that there is a clear structural difference between the binding of the  $\text{SO}_3\text{R}$  group to the sulfonated polyarylene of the present invention and the binding in the sulfonated polymer of the cited prior art. In the compounds of the present invention, the  $\text{SO}_3\text{R}$  group *indirectly* binds to the aromatic ring via the linking group A, *i.e.*, through the  $-(\text{CH}_2)_m-$  or  $-(\text{CF}_2)_n-$  groups. In contrast, the

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SO<sub>3</sub>R group disclosed in the cited references binds *directly* to the aromatic ring of the polymer. Therefore, the sulfonated polyarylene of the present invention is not disclosed or inherent in either EP '554 or EP '555.

Furthermore, as noted by the Examiner, the cited references disclose that incorporation of the sulfonic acid is accomplished by subjecting the copolymer that is *free* of a sulfonic acid group to sulfonation after polymerization. The sulfonation of the polymer is accomplished using a known sulfonating agent, such as sulfuric anhydride, fuming sulfuric acid, chlorosulfonic acid, sulfuric acid or sodium bisulfate. Thus, the polymer is free of -SO<sub>2</sub>- *until after* being sulfonated and then the sulfonyl groups are attached directly to the aromatic ring.

In contrast, the sulfonation of the polyarylene in the present invention is performed through sulfo(fluoro)alkylation, without using a sulfonating agent. (See Specification, pg. 9 line 21 - pg. 10, line 14). Using the sulfo(fluoro)alkylation of the present invention, the -SO<sub>2</sub>- group can be attached *indirectly* to the aromatic ring of the polyarylene, *prior* to hydrolysis of the polyarylene. (See Specification, pg. 3).

Moreover, both EP '554 and EP '555 disclose that group B, which would correspond to group A of the present invention, is an electron donative group. In contrast, the present invention recites that group A is -(ClI<sub>2</sub>)<sub>m</sub>- or -(CF<sub>2</sub>)<sub>m</sub>- (wherein m is an integer of 1 to 10). Thus, the specific structure of the present invention is not taught or suggested by the cited references. Furthermore, the cited references explicitly distinguish between the electron donative groups required as group B and electron withdrawing groups, such as, (CF<sub>2</sub>)<sub>m</sub>. (See EP '554, paragraph 21 and EP '555, paragraph 26).

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Therefore, one skilled in the art would be lead away from using an electron-withdrawing group, such as,  $(\text{CF}_2)_m$ . Accordingly, formula (1') of the present invention, in which group A is  $-(\text{CH}_2)_m-$  or  $-(\text{CF}_2)_m-$  would not be anticipated or obvious in view of EP '554 or EP '555.

In addition, both EP '554 and EP '555 disclose that group Z represents an aryl group with a specific structure or a monovalent condensed ring hydrocarbon. (See EP '554, paragraph 23 and EP '555, paragraph 43). In contrast, the structure that corresponds to group Z in the present invention comprises  $\text{SO}_3\text{R}$ , in which R is a  $\text{C}_{4-20}$  hydrocarbon group. Therefore, even if sulfonated, formulas (1) and (2m) of the cited references would not form the same or similar products as that recited in the present claimed invention. Therefore, the sulfonated polyarylene of the present invention is not disclosed or inherent in either EP '554 or EP '555.

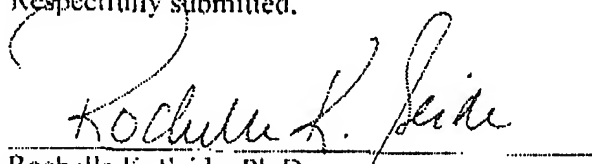
For at least these reasons, Applicants respectfully submit that the present invention is not anticipated or obvious in view of EP '554 or EP '555. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 8 and 9 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over EP '554 and EP '555.

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In view of the foregoing reconsideration and allowance of claims 10-12 is respectfully requested.

Applicants believe that no additional fees are required in connection with this response. However, if additional fees are required, the Commissioner is hereby authorized to charge any additional payment, or credit any overpayment, to Deposit Account No. 01-2300, referencing Docket Number 026035.00006.

Respectfully submitted,



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